United States District Court

EASTERN DISTRICT OF TEXAS
SHERMAN DIVISION

OCEAN SEMICONDUCTOR LLC, *Plaintiff,* v. HUAWEI DEVICE USA, INC., HUAWEI DEVICE CO., LTD., AND HISILICON TECHNOLOGIES CO., LTD., *Defendants*.	§ § § § § § § § § § §	Civil Action No. 4:20-CV-00991-ALM

CLAIM CONSTRUCTION MEMORANDUM AND ORDER

Before the Court are Plaintiff Ocean Semiconductor LLC's ("Plaintiff" or "Ocean") Opening Claim Construction Brief (Dkt. #26), Defendants Huawei Device USA, Inc., Huawei Device Co., Ltd., and HiSilicon Technologies Co., Ltd's ("Defendants" or collectively "Huawei") Responsive Claim Construction Brief (Dkt. #33), and Plaintiff's Reply Claim Construction Brief (Dkt. #34).[1] Also before the Court is the parties' December 23, 2021 Joint Claim Construction and Prehearing Statement (Dkt. #36). The Court held a claim construction hearing on January 14, 2022, to determine the proper construction of the disputed claim terms in U.S. Pat. No. 6,660,651 ("the '651 Patent"), U.S. Pat. No. 7,080,330 ("the '330 Patent"), U.S. Pat. No. 6,725,402 ("the '402 Patent"), U.S. Pat. No. 8,676,538 ("the '538 Patent"), U.S. Pat. No. 6,836,691 ("the '691 Patent"), U.S. Pat. No. 6,907,305 ("the '305 Patent"), and U.S. Pat. No. 6,968,248 ("the '248 Patent") (collectively, "the Asserted Patents").

The Court issues this Claim Construction Memorandum Opinion and Order and hereby

[1] Citations to the parties' filings are to the filing's number in the docket (Dkt. #) and pin cites are to the page numbers assigned through ECF.

incorporates-by-reference the claim construction hearing and transcript. For the following reasons, the Court provides the constructions set forth below.

I. BACKGROUND

Plaintiff asserts seven patents against Defendants. In general, the Asserted Patents relate to technologies supporting semiconductor manufacturing operations. Shortly before the start of the January 14, 2022 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion.

The '651 Patent, titled "Adjustable Wafer Stage, and a Method and System for Performing Process Operations Using Same," issued on December 9, 2003, and was filed on November 8, 2001. The '651 Patent generally relates "to semiconductor fabrication technology, and, more particularly, to an adjustable wafer stage, and a method and system for performing process operations using same." '651 Patent at 1:8–11. The Abstract of the '651 Patent states:

> A process tool comprised of an adjustable wafer stage and various methods and systems for performing process operations using same is disclosed herein. In one illustrative embodiment, the process tool is comprised of a process chamber, and an adjustable wafer stage in the process chamber to receive a wafer positioned thereabove, the wafer stage having a surface that is adapted to be raised, lowered or tilted. In further embodiments, the process tool further comprises at least three pneumatic cylinders or at least three rack and pinion combinations, each of which are operatively coupled to the wafer stage by a ball and socket connection. A system disclosed herein is comprised of a metrology tool for measuring a plurality of wafers processed in a process tool to determine across-wafer variations produced by the process tool, a process tool comprised of an adjustable wafer stage that has a surface adapted to receive a wafer to be processed in the tool, and a controller for adjusting a plane of the surface of the wafer stage based upon the determined across-wafer variations produced by the tool, whereby the process tool processes at least one subsequently processed wafer positioned on the wafer stage after the plane of the surface of the wafer stage has been adjusted.

Claim 19 of the '651 Patent is an illustrative claim and recites the following elements (disputed terms in italics):

> 19. A method, comprising:
> providing a *process chamber* comprised of a wafer stage, said wafer stage having a surface that is adjustable;
> adjusting said surface of said wafer stage by actuating at least one of a plurality of *pneumatic cylinders* that are operatively coupled to said wafer stage to accomplish at least one of raising, lowering and varying a tilt of said surface of said wafer stage;
> positioning a wafer on said wafer stage; and
> performing a process operation on said wafer positioned on said wafer stage.

The '330 Patent, titled "Concurrent Measurement of Critical Dimension and Overlay in Semiconductor Manufacturing," issued on July 18, 2006, and was filed on March 5, 2003. The '330 Patent generally relates "to monitoring and/or controlling a semiconductor fabrication process, and in particular to a system and methodology for concurrently measuring critical dimensions and overlay during the fabrication process and controlling operating parameters to refine the process in response to the measurements." '330 Patent at 1:6–12. The Abstract of the '330 Patent states:

> A system and methodology are disclosed for monitoring and controlling a semiconductor fabrication process. One or more structures formed on a wafer matriculating through the process facilitate concurrent measurement of critical dimensions and overlay via scatterometry or a scanning electron microscope (SEM). The concurrent measurements mitigate fabrication inefficiencies, thereby reducing time and real estate required for the fabrication process. The measurements can be utilized to generate feedback and/or feed-forward data to selectively control one or more fabrication components and/or operating parameters associated therewith to achieve desired critical dimensions and to mitigate overlay error.

Claim 19 of the '330 Patent is an illustrative claim and recites the following elements (disputed term in italics):

> 19. A method for monitoring and controlling a semiconductor fabrication process comprising:
> providing a plurality of wafers undergoing the fabrication process;

> mapping the plurality of wafers into one or more logical grids comprising one or more portions in which a grating structure for use in concurrent measurements is formed;
> *concurrently measuring* one or more critical dimensions and overlay in a wafer undergoing the fabrication process; determining if one or more of the critical dimensions are outside of acceptable tolerances;
> determining whether an overlay error is occurring;
> developing control data based upon one or more concurrent measurements when at least one of an overlay error is occurring and one or more of the critical dimensions fall outside of acceptable tolerances; and
> feeding forward or backward the control data to adjust one or more fabrication components or one or more operating parameters associated with the fabrication components when at least one of an overlay error is occurring and one or more of the critical dimensions fall outside of acceptable tolerances to mitigate overlay error and/or to bring critical dimension within acceptable tolerances.

The '402 Patent, titled "Method and Apparatus for Fault Detection of a Processing Tool and Control Thereof Using an Advanced Process Control (APC) Framework," issued on April 20, 2004, and was filed on July 31, 2000. The '402 Patent generally relates "to semiconductor fabrication technology, and, more particularly, to a method and apparatus for fault detection and control of a processing tool using an Advanced Process Control (APC) framework." '402 Patent at 1:9–12. The Abstract of the '402 Patent states:

> A method and apparatus for providing fault detection in an Advanced Process Control (APC) framework. A first interface receives operational state data of a processing tool related to the manufacture of a processing piece. The state data is sent from the first interface to a fault detection unit. A fault detection unit determines if a fault condition exists with the processing tool based upon the state data. A predetermined action is performed on the processing tool in response to the presence of a fault condition. In accordance with one embodiment, the predetermined action is to shutdown the processing tool so as to prevent further production of faulty wafers.

Claim 1 of the '402 Patent is an illustrative claim and recites the following elements (disputed term in italics):

> 1.A method comprising:

> receiving at a first interface operational state data of a processing tool related to the manufacture of a processing piece;
> sending the state data from the first interface to a fault detection unit, wherein the act of sending comprises: sending the state data from the first interface to a data collection unit;
> accumulating the state data at the data collection unit; translating the state data from a first communications protocol to a second communications protocol compatible with the fault detection unit; and sending the translated state data from the data collection unit to the fault detection unit; determining if a fault condition exists with the processing tool based upon the state data received by the fault detection unit;
> performing a predetermined action on the processing tool in response to the presence of a fault condition; and
> sending an alarm signal indicative of the fault condition to an *advanced process control framework* from the fault detection unit providing that a fault condition of the processing tool was determined by the fault detection unit,
> wherein performing a predetermined action further comprises sending a signal by the framework to the first interface reflective of the predetermined action.

The ’538 Patent, titled “Adjusting Weighting of a Parameter Relating to Fault Detection Based on a Detected Fault,” issued on March 18, 2014, and was filed on November 2, 2004. The ’538 Patent generally relates “to semiconductor manufacturing, and, more particularly, to a method, system, and apparatus for performing a process to improve fault detection reliability through feedback.” ’538 Patent at 1:9–12. The Abstract of the ’538 Patent states:

> A method, apparatus and a system, for provided for performing a dynamic weighting technique for performing fault detection. The method comprises processing a workpiece and performing a fault detection analysis relating to the processing of the workpiece. The method further comprises determining a relationship of a parameter relating to the fault detection analysis to a detected fault and adjusting a weighting associated with the parameter based upon the relationship of the parameter to the detected fault.

Claims 1 and 5 of the ’538 Patent is an illustrative claim and recites the following elements (disputed term in italics):

> 1.A method, comprising:
> performing in a computer a fault detection analysis relating to processing of a workpiece;

> determining in a said computer a relationship of a parameter relating to said fault detection analysis to a detected fault;
> adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault; and
> performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting.
>
> 5. The method of claim 1, further comprising:
> designated in said computer whether said detected fault is a *significant fault*; and
> adjusting said weighting associated with said parameter based responsive to designating said detected fault as a *significant fault*.

The '691 Patent, titled "Method and Apparatus for Filtering Metrology Data Based on Collection Purpose," issued on December 28, 2004, and was filed on May 1, 2003. The '691 Patent generally relates "to an industrial process, and, more particularly, to a method and apparatus for filtering metrology data based on collection purpose in a semiconductor device manufacturing environment." '691 Patent at 1:8–11. The Abstract of the '691 Patent states:

> A method includes collecting metrology data related to the processing of workpieces in a plurality of tools. Context data for the metrology data is generated. The context data includes collection purpose data. The metrology data is filtered based on the collection purpose data. A process control activity related to one of the tools is conducted based on the filtered metrology data. A system includes at least one metrology tool, a computer, and a process controller. The metrology tool is configured to collect metrology data related to the processing of workpieces in a plurality of tools. The computer is configured to generate context data for the metrology data, the context data including collection purpose data. The process controller is configured to filter the metrology data based on the collection purpose data and conduct a process control activity related to one of the tools based on the filtered metrology data.

Claim 1 of the '691 Patent is an illustrative claim and recites the following elements (disputed term in italics):

> 1.A method, comprising:
> collecting metrology data related to the processing of workpieces in a plurality of tools;

> generating context data for the metrology data, the context data including *collection purpose data*;
> filtering the metrology data based on the *collection purpose data*; and
> conducting a process control activity related to one of the tools based on the filtered metrology data.

The '305 Patent, titled "Agent Reactive Scheduling in an Automated Manufacturing Environment," issued on June 14, 2005, and was filed on April 30, 2002. The '305 Patent generally relates "to automated manufacturing environments, and, more particularly, to scheduling in an automated manufacturing environment." '305 Patent at 1:16–18. The Abstract of the '305 Patent states:

> A method and apparatus for scheduling in an automated manufacturing environment, comprising are disclosed. The method includes detecting an occurrence of a predetermined event in a process flow; notifying a software scheduling agent of the occurrence; and reactively scheduling an action from the software scheduling agent responsive to the detection of the predetermined event. The apparatus is automated manufacturing environment including a process flow and a computing system. The computing system further includes a plurality of software scheduling agents residing thereon, the software scheduling agents being capable of reactively scheduling appointments for activities in the process flow responsive to a plurality of predetermined events.

Claim 1 of the '305 Patent is an illustrative claim and recites the following elements (disputed term in italics):

> 1.A method for scheduling in an automated manufacturing environment, comprising:
> detecting an occurrence of a predetermined event in a process flow;
> notifying a *software scheduling agent* of the occurrence; and
> reactively scheduling an action from the *software scheduling agent* responsive to the detection of the predetermined event.

The '248 Patent, titled "Agent Reactive Scheduling in an Automated Manufacturing Environment," issued on November 22, 2005, and was filed on June 13, 2005. The '248 Patent generally relates "to automated manufacturing environments, and, more particularly, to scheduling in an automated manufacturing environment." '248 Patent at 1:19–21. The Abstract of the '248

Patent states:

> A method and apparatus for scheduling in an automated manufacturing environment, comprising are disclosed. The method includes detecting an occurrence of a predetermined event in a process flow; notifying a software scheduling agent of the occurrence; and reactively scheduling an action from the software scheduling agent responsive to the detection of the predetermined event. The apparatus is automated manufacturing environment including a process flow and a computing system. The computing system further includes a plurality of software scheduling agents residing thereon, the software scheduling agents being capable of reactively scheduling appointments for activities in the process flow responsive to a plurality of predetermined events.

Claim 1 of the '248 Patent is an illustrative claim and recites the following elements (disputed term in italics):

> 1. A method for scheduling in an automated manufacturing environment, comprising:
> automatically detecting an occurrence of a predetermined event in an integrated, automated process flow;
> automatically notifying a *software scheduling agent* of the occurrence; and
> reactively scheduling an action from the *software scheduling agent* responsive to the detection of the predetermined event.

II. LEGAL PRINCIPLES

A. Claim Construction

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *Id.* at 1313; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at

861. The general rule—subject to certain specific exceptions discussed *infra*—is that each claim term is construed according to its ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003); *Azure Networks, LLC v. CSR PLC*, 771 F.3d 1336, 1347 (Fed. Cir. 2014) (quotation marks omitted) ("There is a heavy presumption that claim terms carry their accustomed meaning in the relevant community at the relevant time.") *cert. granted, judgment vacated,* 135 S. Ct. 1846 (2015).

"The claim construction inquiry . . . begins and ends in all cases with the actual words of the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). "[I]n all aspects of claim construction, 'the name of the game is the claim.'" *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014) (quoting *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998)) *overruled on other grounds by Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015). First, a term's context in the asserted claim can be instructive. *Phillips*, 415 F.3d at 1314. Other asserted or unasserted claims can also aid in determining the claim's meaning, because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id*. For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id*. at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id*. (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id*. (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.*,

299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id*.

The specification may also resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex, Inc.*, 299 F.3d at 1325. But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. "[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004).

The prosecution history is another tool to supply the proper context for claim construction because, like the specification, the prosecution history provides evidence of how the U.S. Patent and Trademark Office ("PTO") and the inventor understood the patent. *Phillips*, 415 F.3d at 1317. However, "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Id.* at 1318; *see also Athletic Alts., Inc. v. Prince Mfg.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (ambiguous prosecution history may be "unhelpful as an interpretive resource").

Although extrinsic evidence can also be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id*. at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are not helpful to a court. *Id*. Extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id*. The Supreme Court has explained the role of extrinsic evidence in claim construction:

> In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period. *See, e.g., Seymour v. Osborne*, 11 Wall. 516, 546 (1871) (a patent may be "so interspersed with technical terms and terms of art that the testimony of scientific witnesses is indispensable to a correct understanding of its meaning"). In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the "evidentiary underpinnings" of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal.

Teva Pharm. USA, Inc. v. Sandoz, Inc., 574 U.S. 318, 331–32 (2015).

B. Departing from the Ordinary Meaning of a Claim Term

There are "only two exceptions to [the] general rule" that claim terms are construed according to their plain and ordinary meaning: "1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of the claim term either in the specification or during prosecution."[2] *Golden Bridge Tech., Inc. v. Apple Inc.*, 758 F.3d

[2] Some cases have characterized other principles of claim construction as "exceptions" to the

1362, 1365 (Fed. Cir. 2014) (quoting *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)); *see also GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal."). The standards for finding lexicography or disavowal are "exacting." *GE Lighting Sols.*, 750 F.3d at 1309.

To act as his own lexicographer, the patentee must "clearly set forth a definition of the disputed claim term," and "clearly express an intent to define the term." *Id.* (quoting *Thorner*, 669 F.3d at 1365); *see also Renishaw*, 158 F.3d at 1249. The patentee's lexicography must appear "with reasonable clarity, deliberateness, and precision." *Renishaw*, 158 F.3d at 1249.

To disavow or disclaim the full scope of a claim term, the patentee's statements in the specification or prosecution history must amount to a "clear and unmistakable" surrender. *Cordis Corp. v. Bos. Sci. Corp.*, 561 F.3d 1319, 1329 (Fed. Cir. 2009); *see also Thorner*, 669 F.3d at 1366 ("The patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope."). "Where an applicant's statements are amenable to multiple reasonable interpretations, they cannot be deemed clear and unmistakable." *3M Innovative Props. Co. v. Tredegar Corp.*, 725 F.3d 1315, 1326 (Fed. Cir. 2013).

C. Definiteness Under 35 U.S.C. § 112, ¶ 2 (pre-AIA) / § 112(b) (AIA)

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112, ¶ 2. A claim, when viewed in light of the intrinsic evidence, must "inform those skilled in the art about the scope of the invention with reasonable certainty."

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general rule, such as the statutory requirement that a means-plus-function term is construed to cover the corresponding structure disclosed in the specification. *See, e.g., CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1367 (Fed. Cir. 2002).

Nautilus Inc. v. Biosig Instruments, Inc., 572 U.S. 898, 910 (2014). If it does not, the claim fails § 112, ¶ 2 and is therefore invalid as indefinite. *Id.* at 901. Whether a claim is indefinite is determined from the perspective of one of ordinary skill in the art as of the time the application for the patent was filed. *Id.* at 911. As it is a challenge to the validity of a patent, the failure of any claim in suit to comply with § 112 must be shown by clear and convincing evidence. *BASF Corp. v. Johnson Matthey Inc.,* 875 F.3d 1360, 1365 (Fed. Cir. 2017). "[I]ndefiniteness is a question of law and in effect part of claim construction." *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012).

When a term of degree is used in a claim, "the court must determine whether the patent provides some standard for measuring that degree." *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quotation marks omitted). Likewise, when a subjective term is used in a claim, "a court must determine whether the patent's specification supplies some standard for measuring the scope of the [term]." *Ernie Ball, Inc. v. Earvana, LLC*, 502 F. App'x 971, 980 (Fed. Cir. 2013) (citations omitted). The standard "must provide objective boundaries for those of skill in the art." *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014).

III. LEVEL OF ORDINARY SKILL IN THE ART FOR THE ASSERTED USWS PATENTS

It is well established that patents are interpreted from the perspective of one of ordinary skill in the art. *See Phillips*, 415 F.3d at 1313 ("[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application."). The Federal Circuit has advised that the "[f]actors that may be considered in determining the level of skill in the art include: (1) the educational level of the inventors; (2) the type of problems encountered in the art; (3) prior art solutions to those problems; (4) the rapidity with which innovations are made;

(5) sophistication of the technology; and (6) education level of active workers in the field." *Env'tl Designs, Ltd. v. Union Oil Co. of California*, 713 F.2d 693, 696 (Fed. Cir. 1983). "These factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art." *Daiichi Sankyo Co. Ltd. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

Plaintiff contends that a person of ordinary skill in the art was a person with: (i) a B.S. in Engineering, Materials Science or a related field such as advanced process control with at least three years of experience in semiconductor manufacturing or (ii) at least an M.S. in Engineering or Materials Science. Plaintiff further argues that additional education or experience could also serve as a substitute for these requirements.

Defendants contend that a person of ordinary skill in the art would have had at least a B.S. in mechanical engineering, electrical engineering, materials science engineering, or a related field. Defendants further argue that in addition to this educational requirement, a person of ordinary skill in the art would have four years of experience working with semiconductor fabrication processes. Specifically, for the '651 Patent, Defendants argue that a person of ordinary skill in the art would have had four years of experience designing and developing semiconductor fabrication processes and tooling, and for the '538 Patent four years of experience working with semiconductor fabrication processes, including computer programming and data analysis. Defendants also argue that advanced education may substitute for experience.

Having considered the parties' proposals, and the factors that may be considered in determining the level of skill in the art, the Court finds that a person of ordinary skill in the art would have had at least a B.S. in mechanical engineering, electrical engineering, materials science engineering, or a related field. In addition to this educational requirement, a person of ordinary skill would have at least three years of experience in semiconductor manufacturing. The Court

notes that any differences in the parties' proposals do not appear to be significant for the purpose of claim construction.

I. THE PARTIES' STIPULATED TERMS

The parties agreed to the construction of the following term in their P.R. 4-5(d) Joint Claim Construction Charts.

Claim Term/Phrase	Agreed Construction
"fault detection unit" '402 Patent: 1, 3-5, 7-11, 13	No construction is necessary.
"operational state data of a process tool" '402 Patent: 1	No construction is necessary.
"additional state data of the processing tool" '402 Patent: 3	No construction is necessary.
"the state data" '402 Patent: 1, 4-6, 8, 10-11	No construction is necessary.
"grating structure" '330 Patent: 1, 19	No construction is necessary.
"tool state data" '538 Patent: 10-11, 28-29	No construction is necessary.

Dkt. #36 at 2. In view of the parties' agreement on the proper construction of the identified terms, the Court hereby **ADOPTS** the Parties' agreement that these terms do not require construction.

II. CONSTRUCTION OF DISPUTED TERMS IN THE ASSERTED USWS PATENTS

The parties' dispute the meaning and scope of thirteen terms or phrases in the Asserted Patents.

A. "process chamber"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"process chamber"	No construction is necessary.	"chamber of a process tool where process operations are performed"

1. Analysis

The term "process chamber" appears in Claims 19-24, 31-32, 34-37, 72-75, and 77-81 of the '651 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the term "process chamber" should be construed to mean "chamber of a process tool where process operations are performed," as Defendants propose.[3]

The Court finds that the term should be construed, but not exactly as Defendants propose. The "Field of the Invention" section states that the "invention relates generally to semiconductor fabrication technology, and, more particularly, to an adjustable wafer stage, and a method and system for performing process operations using same." '651 Patent at 1:8–11. Likewise, the "Summary of the Invention" section states that the "present invention is generally directed to a process tool comprised of an adjustable wafer stage, and various methods and systems for performing process operations using same." *Id.* at 3:6–9. Similarly, the specification states that "the present invention may be employed with a variety of processes performed in semiconductor manufacturing." *Id.* at 4:67–5:2. Thus, the intrinsic evidence indicates that the recited "process" relates to semiconductor manufacturing operations.

Regarding the "chamber" aspect of the disputed term, the specification discloses that "[i]n manufacturing semiconductor devices, many deposition processes and etching processes may be performed." *Id.* at 2:25–26. The specification states that "many, if not all, of such [process] tools

[3] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 7); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 9-10); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 5-6).

have a process chamber, where processing operations will be performed, and a wafer stage or chuck in the process chamber that is adapted to hold a wafer in position during processing." *Id.* at 5:15–18. Accordingly, a person of ordinary skill in the art would understand that the "process chamber" is the "chamber where semiconductor manufacturing operations may be performed." Indeed, Plaintiff's expert, Mr. Ron Maltiel, agrees that the process chamber is a chamber where semiconductor manufacturing operations are performed. *See e.g.*, Dkt. # 33-13 at 79:2-4 ("And so the chamber is the thing that's–where the processing is done inside the process tool.").

Plaintiff argues that the term "process chamber" does not have any specialized meaning in the art or in the context of the patents. Plaintiff contends that nothing in this description requires the process chamber to be the place where "process operations are performed." According to Plaintiff, when a tool does not have a process chamber the process operations must necessarily be performed in places other than the process chamber. Plaintiff further argues that the specification discloses that the process chamber is not the only place where "process operations are performed," because such operations can be performed inside the process tool or elsewhere in the absence of a process chamber. Dkt. #34 at 5 (citing '651 Patent at 5:15–16). Plaintiff also argues that the sentence upon which Defendants rely for their construction only says that "process operations will be performed," not that such operations "must be" or "will necessarily be" performed in process chambers.

In the context of the intrinsic evidence, the Court does not find Plaintiff's argument persuasive. Plaintiff effectively argues that a "process chamber" can be any chamber, which would render the word "process" meaningless. Proposed constructions that read words out of a claim are improper and should be rejected. *See e.g., Exxon Chemical Patents, Inv. v. Lubrizol Corp.*, 64 F.3d 1553, 1557 (Fed. Cir. 1995) ("We must give meaning to all the words in [the] claims."); *Bicon,*

Inc. v. Straumann Co., 441 F.3d 945, 951 (Fed. Cir. 2006) (holding that a claim construction that reads limitations out of the claim "would be contrary to the principle that claim language should not [be] treated as meaningless."). The Court generally agrees that when a tool does not have a process chamber, the process operations must necessarily be performed in places other than the process chamber. However, when the claim language recites a "process chamber" it explicitly recites what process must be performed in the recited chamber.

2. Court's Construction

For the reasons set forth above, the Court construes the term **"process chamber"** to mean **"chamber where semiconductor manufacturing operations may be performed."**

B. "pneumatic cylinder"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"pneumatic cylinder"	No construction is necessary, or in the alternative, "a pneumatic, hydraulic, electromagnetic or mechanical device."	"Actuator that uses compressed gas to move a piston inside a cylinder" Alternatively: "air cylinder"

1. Analysis

The term "pneumatic cylinder" appears in Claims 19-24, 75, and 81 of the '651 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether a "pneumatic cylinder" may include "a pneumatic, hydraulic, electromagnetic or mechanical device," as Plaintiff proposes, or if it is limited to an "actuator that uses compressed gas to move a piston inside a cylinder," as Defendants propose.[4]

[4] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 7-9); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 13-16); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 7-10).

The specification states that "the present invention is directed to a process tool comprised of an adjustable wafer stage, and various methods and systems for performing process operations using same." '651 Patent at 4:59–62. To adjust the wafer-stage, the specification discloses using "a variety of devices, such as pneumatic, hydraulic, electromagnetic or mechanical systems." *Id.* at 5:65–6:1; *see also id*. at 6:66–7:16. Figure 2, reproduced below, illustrates an adjustable wafer stage 40 with a pneumatic cylinder 46.

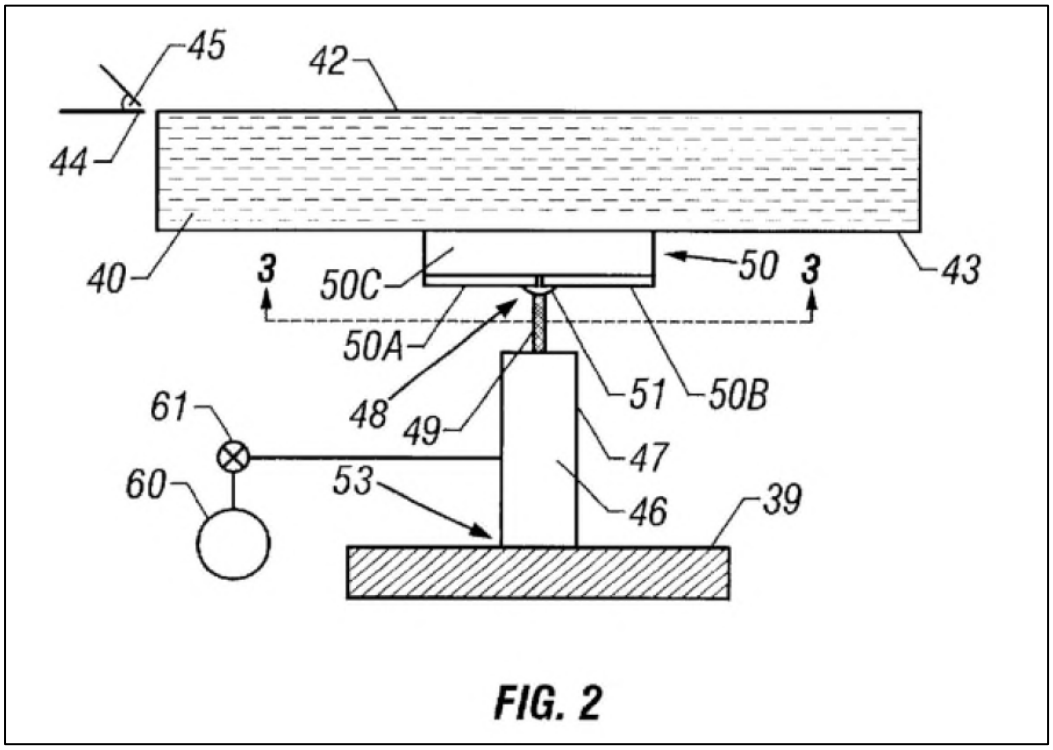

FIG. 2

The specification further describes three pneumatic cylinders as follows:

> In the disclosed embodiment, each of three pneumatic cylinders 46 (only one of which is shown in FIG. 2) are operatively coupled to the bottom surface 43 of the wafer stage 40 via a ball and socket connection 48. As shown in FIG. 3, a bottom view taken along the line "3--3" in FIG. 2, the pneumatic cylinders 46 are spaced apart approximately 120 degrees under the wafer stage 40. *Also depicted in FIG. 2 is an illustrative manifold 60 and a valve 61 that will be used in actuating the pneumatic cylinder 46 to control the position of the surface 42 of the wafer stage* ***40.*** Only one valve 61 is depicted in FIG. 2. However, each cylinder 46 may have its own valve 61 such that each of the cylinders 46 may be independently controlled.

> The pneumatic cylinders 46 may be any type of pneumatic cylinders useful for performing the function of adjusting the surface 42 of the wafer stage 40. For example, the pneumatic cylinders 46 may be dual-acting pneumatic cylinders. The stroke, size and supply pressure to such cylinders may vary depending upon the particular application. *Air or an inert gas may be supplied to the cylinders 46 at the required pressure through flexible hoses (not shown).*

Id. at 6:1–21 (emphasis added). Thus, a person of ordinary skill in the art would understand that a "pneumatic cylinder" is a "device that is actuated by air or gas."

The extrinsic evidence is consistent with the intrinsic evidence, and defines "pneumatic" as pertaining or relating to air or gas. *See, e.g.*, Dkt. #33-9 at 4 (American Heritage Dictionary) (defining "pneumatic" as "Of or relating to air or other gases" or "Filled or operated by air"); Dkt. #33-10 at 5 (Dictionary of Engineering) (defining "pneumatic" as "Pertaining to or operated by air or other gas"); Dkt. #33-11 at 6 (Merriam-Webster Dictionary) (defining "pneumatic" as "of, relating to or using gas (as air or wind)" and "moved or worked by air pressure"). Accordingly, a person of ordinary skill in the art would understand "pneumatic cylinder" means a "device that is actuated by air or gas."

Plaintiff contends that the term "pneumatic cylinder" encompasses pneumatic, hydraulic, electromagnetic or mechanical devices. Plaintiff's reading of this term impermissibly expands the scope of the claims. The specification discloses that "[a] mechanism useful in adjusting the position of the wafer stage 40 may be comprised of any of a variety of devices, such as pneumatic, hydraulic, electromagnetic or mechanical systems." '651 Patent at 5:65–6:1. However, the Asserted Claims are not so broadly worded, but instead explicitly recite a pneumatic system. *See e.g.*, Claim 19 ("A method comprising: … adjusting said surface of said wafer stage by actuating at least one of a plurality of *pneumatic cylinders*…") (emphasis added).

Indeed, other claims recite devices that are not pneumatic devices. For example, Claim 25 recites a "rack and pinion combination" for adjustment of the wafer stage as opposed to pneumatic

cylinders. Plaintiff's construction would negate the difference in claim scope expressed by the patentee. *Versa Corp. v. Ag-Bag Int'l Ltd.*, 392 F.3d 1325, 1329–30 (Fed. Cir. 2004) ("The doctrine of claim differentiation 'create[s] a presumption that each claim in a patent has a different scope.'") (citation omitted). The specification further illustrates the distinction by stating "[o]f course, *structures other than the pneumatic cylinders 46* depicted in FIG. 2 may be employed for raising, lowering or tilting the surface 42 of the wafer stage 40. For example, as shown in FIGS. 4 and 5, *in place of each of the pneumatic cylinders 46*, a rack and pinion assembly arrangement 80 may be provided." '651 Patent at 6:66–7:4 (emphasis added). A structure that is used *in place of* the pneumatic cylinders is by definition not the same structure as a pneumatic cylinder.

Plaintiff argues that nothing in the intrinsic record would necessarily limit this term to only pneumatic. Plaintiff's argument ignores the claim language, which recites a "pneumatic cylinder." In other words, the claim language does not recite any mechanism for adjusting the wafer stage as Plaintiff suggests, but instead recites a "pneumatic cylinder." Plaintiff further argues that Defendants do not deny that pneumatic cylinders also provide hydraulic, electromagnetic and/or mechanical functions. The Court agrees that a "pneumatic cylinder" will include a mechanical structure, but at a minimum, it will be a "device that is actuated by air or gas."

2. Court's Construction

For the reasons set forth above, the Court construes the term **"pneumatic cylinder"** to mean **"device that is actuated by air or gas"**

C. "process tool"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"process tool"	No construction is necessary.	"device for performing semiconductor manufacturing process operations"

1. Analysis

The term "process tool" appears in Claims 31 and 32 of the '651 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the term "process tool" should be construed to mean "device for performing semiconductor manufacturing process operations," as Defendants propose.[5]

The Court finds that a person of ordinary skill in the art would understand that the term "process tool" refers to a tool capable of performing a semiconductor manufacturing operation. As discussed above, the "Summary of the Invention" section states that the "present invention is generally directed to a process tool comprised of an adjustable wafer stage, and various methods and systems for performing process operations using same." '651 Patent at 3:6–9. Likewise, the "Field of the Invention" section states that the "invention relates generally to semiconductor fabrication technology, and, more particularly, to an adjustable wafer stage, and a method and system for performing process operations using same." *Id.* at 1:8–11.

Similarly, the specification states that "the present invention may be employed with a variety of processes performed in semiconductor manufacturing." *Id.* at 4:67–5:2. The specification also states that the "process tool" refers to those tools commonly "found in semiconductor manufacturing operations." *Id.* at 7:28–30. Indeed, the specification discloses that "the present invention is directed to a process tool comprised of an adjustable wafer stage, and various methods and systems for performing process operations using same." *Id.* at 4:59–62. Thus,

[5] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 9-10); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 10-11); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 10).

the intrinsic evidence indicates that the recited "process tool" means "a tool capable of performing a semiconductor manufacturing operation."

Plaintiff argues that the term "process tool" does not have any specialized meaning in the art or in the context of the patents. Plaintiff contends that Defendants impermissibly read a limitation from the specification into the claims. Plaintiff further contends that nothing in the specification defines what a process tool must be. According to Plaintiff, the fact that the patentee used the phrase "may be any type" demonstrates his intent not to constrict the setting in which the tool must be used. Dkt. #26 at 10 (citing '651 Patent at 7:28–30 ("The process tool 72 may be any type of processing tool commonly found in semiconductor manufacturing operations.")). The Court disagrees.

As discussed above, the specification indicates that the "process tool" is a "tool capable of performing a semiconductor manufacturing operation." Moreover, Plaintiff's argument would read the word "process" out of this disputed claim term. Indeed, the specification provides that the "process tools" are those tools used in semiconductor manufacturing operations. *See e.g.*, '651 Patent at 3:7–9, 7:28–30. Accordingly, the Court rejects Plaintiff's argument.

2. Court's Construction

For the reasons set forth above, the Court construes the term **"process tool"** to mean **"tool capable of performing a semiconductor manufacturing operation."**

D. "said process chamber"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"said process chamber"	"said process tool"	Indefinite

1. Analysis

The term "said process chamber" appears in Claim 31 of the '651 Patent. The parties do

not dispute that there is no antecedent basis for the term "said process chamber" in Claim 31. The parties dispute whether the term can be corrected to mean "said process tool," as Plaintiff proposes.[6]

Claim 31 recites the following:

> 31. A method, comprising:
> performing a process operation in a process tool on each of a plurality of wafers;
> measuring a plurality of said processed wafers to determine across-wafer variations produced by said process operation performed in said process tool;
> adjusting, based upon said measured across-wafer variations, a plane of a surface of an adjustable wafer stage; and
> performing said process operation on at least one subsequently processed wafer positioned on said wafer stage in *said process chamber* after said plane of said wafer stage has been adjusted.

'651 Patent at Claim 31 (emphasis added). There is no antecedent basis for the term "said process chamber" in Claim 31. According to Plaintiff, there is no uncertainty that "said process chamber" must mean "said process tool," because the first two claim limitations explicitly recite "a process operation in a process tool" and "said process operation performed in said process tool." Plaintiff argues that its proposal is correct because the claimed invention is not limited to a single embodiment.

Plaintiff is asking the Court to correct an error in the claim. A district court can only correct an error in a claim if "(1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims." *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1357 (Fed. Cir. 2003).The Court finds that these conditions are not met here.

[6] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 10-13); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 11-13); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 6-7).

The claims and intrinsic record demonstrate that Plaintiff's proposed correction of "said process chamber" to "said process tool" is subject to reasonable debate and, therefore, impermissible. *Trusted Knight Corp. v. Int'l Bus. Machines Corp.*, 681 F. App'x 898, 903–04 (Fed. Cir. 2017) (non-precedential) (affirming district court's finding of indefiniteness where the claim "was not amenable to correction" and that where a party's attempt to correct error through claim construction is "subject to reasonable debate based on consideration of the claim language and the specification," the proposed correction is impermissible). Plaintiff argues that "[t]he specification offers two embodiments: in one, process tools have a process chamber; in another, they do not." Dkt. #34 at 6. Thus, by Plaintiff's own admission a "process tool" and "process chamber" are not the same. Indeed, the specification describes the process chamber and process tool as different components. *See e.g.*, '651 Patent at 5:15–19 ("However, many, if not all, of such tools have a process chamber, where processing operations will be performed, and a wafer stage or chuck in the process chamber that is adapted to hold a wafer in position during processing, typically through use of vacuum pressure or one or more clamps."), 3:37–47 ("Another illustrative method of the present invention comprises performing a process operation in a process tool on each of a plurality of wafers, … and performing the process operation on at least one subsequently processed wafer positioned on the wafer stage in the process chamber after the plane of the wafer stage has been adjusted.").

There is nothing in the intrinsic record supporting Plaintiff's proposal that "said process chamber" should be construed as "said process tool" as opposed to a different interpretation of the claims. For example, correcting "said process chamber" to "a process chamber". Therefore, Plaintiff's construction is subject to reasonable debate because "said process chamber" could mean "a process chamber" or "a process tool." For example, other claims recite both "process tool[s]"

and "process chamber[s]." *Id.* at Claim 1 (reciting "[a] process tool, comprising: a process chamber. . . ."), 12:1–9, 16:38–46, 16:53–61, 17:1–10. The Court finds that there is a reasonable debate as to the intended scope of the claim, and it is unclear how the claim should be corrected. Accordingly, the scope of Claim 31 is not reasonably ascertainable by those skilled in the art and the claim is indefinite.

2. Court's Construction

The term **"said process chamber"** is indefinite for failing to inform, with reasonable certainty, those skilled in the art about the scope of the invention.

E. "a ball and socket connection"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"a ball and socket connection"	No construction is necessary.	Plain and ordinary meaning Alternatively: "a mechanical connection having a ball and socket arrangement"

1. Analysis

The term "a ball and socket connection" appears in Claim 24 of the '651 Patent. The parties dispute whether the term requires construction.[7] Defendants contend that Plaintiff seeks to expand the scope of the claim by ignoring the express words of the claim term. Defendants argue that Plaintiff contends that the "ball and socket connection" need not be limited to a ball and socket arrangement. For its part, Plaintiff argues that the specification states that "the ball and socket connection 48 may be achieved by a variety of different structures known to those skilled in the art." Dkt. #26 at 13 (citing '651 Patent at 6:29–32). According to Plaintiff, a ball and socket connection need not be a "mechanical connection having a ball and socket arrangement," because

[7] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 13); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 16-17); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 10-11).

nothing in the specification limits the type or form of a ball and socket connection.

The Court rejects Plaintiff's argument. The specification distinguishes between a ball and socket connection and other type of connections. For example, the specification states the following:

> The illustrative pneumatic cylinder 46 depicted in FIG. 2 is comprised of a housing 47, a shaft 49 and a ball 51 coupled to the shaft 49. The ball 51 of the cylinder 46 is operatively coupled to a housing 50 in a ball and socket arrangement 48. The housing 50 is comprised of three sections 50A, 50B and 50C. In the disclosed embodiments, the section 50C is secured to the bottom surface 43 of the wafer stage 40, and the sections 50A, 50B are secured to the section 50C by a plurality of screws 59. See FIG. 3. *Of course, the ball and socket connection 48 may be achieved by a variety of different structures known to those skilled in the art.* Moreover, the present inventions may be employed in situations where the pneumatic cylinders 46 may be coupled to the wafer stage 40 by another type of connection, e.g., a pinned connection. *Thus, the particular details of the manner in which the cylinders 46 are operatively coupled to the wafer stage 40 should not be considered limitations of the present invention unless such details are specifically set forth in the appended claims.*

'651 Patent at 6:22–40 (emphasis added). Here, Claim 24 "specifically sets forth" a "ball and socket connection," and not "a variety of different structures." To the extent that Plaintiff argues that "a ball and socket connection" does not require a ball and socket arrangement, the Court rejects that argument. However, Defendants' alternative construction does not provide further clarity, so the term is given its plain and ordinary meaning.

2. Court's Construction

For the reasons set forth above, the term **"a ball and socket connection"** is given its **plain and ordinary meaning.**

F. "software scheduling agent"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"software scheduling agent"	No construction is necessary.	"a software agent that schedules, initiates, and executes activities on behalf of a single manufacturing domain entity"

1. Analysis

The term "software scheduling agent" appears in Claims 1 and 11 of the '305 Patent, and Claims 1, 6, and 9 of the '248 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the software agent needs to perform all three functions of scheduling, initiating, and executing activities. The parties also dispute whether the software agent is limited to acting on behalf of a single manufacturing domain.[8]

Regarding the first dispute related to whether the software agent must perform all three functions, Defendants argue that the '305 Patent states that "[o]f particular interest to the present invention, the software agents 265 reactively schedule, initiate, and execute activities on behalf of their respective manufacturing domain entities." Dkt. #33 at 18 (citing'305 Patent at 6:61–64). According to Defendants, this "present invention" language shows that the applicant defined "software scheduling agent" by clearly setting forth a definition of the disputed claim term." Dkt. #33 at 19. The Court disagrees that this phrase from the specification was intended to limit the scope of the claims. *See Thorner v. Sony Computer Entm't Am.*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) ("To act as its own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning") (citation omitted).

The specification indicates that the software agents can perform any of these functions without requiring performance of all three functions, as Defendants' construction would require. For example, the specification describes the software scheduling agents as performing scheduling and initiating activities (*i.e.*, without requiring execution). *See, e.g.*, '305 Patent at 7:7–8. The

[8] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 14-17); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 18-22); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 11-14).

specification also describes several types of software scheduling agents, such as an LSA, MSA, PMSA, and RSA, that "schedule[] activities" on behalf of lots, process tools, PMs/Quals, and resources, but does not state that they must also initiate and execute such activities. *Id.* at 7:18–29. Furthermore, requiring the software scheduling agent to perform all three functions irrespective of context contradicts the intrinsic record. For example, where the processing equipment is in an "unready" state, which the specification defines as "the tentative appointment hav[ing] been booked, but is not ready for execution," it does not follow that the software scheduling agent must perform any function other than scheduling the "tentative appointment." *Id.* at 12:46–47.

Thus, the specification does not contain any language, much less clearly set forth a definition that would redefine the "software scheduling agent" term to require performance of more than just the scheduling function. While a software scheduling agent may perform all three functions of scheduling, initiating, and executing activities, the specification does not require that it do so. The evidence cited by Defendants does not require the same software scheduling agent to perform all three functions.

Regarding the second dispute, the Court finds that the intrinsic evidence indicates that the software agent is limited to acting on behalf of a single manufacturing domain. The patentees relied on an understanding of a "software scheduling agent" as operating on behalf of a single manufacturing domain entity at any given time during prosecution. Specifically, the patentees made clear that the specification could not support any relationship that includes more than one manufacturing domain entity. The patentees argued that "there is *no support* in applicants' specification for the proposition that a scheduling agent *represent more than one manufacturing domain entity at any given time*." Dkt. #33-14 at 15-16 (emphases added).

The patentees repeated this assertion on appeal, stating "there is no support in Applicants'

specification for the proposition that a scheduling agent represents more than one manufacturing domain entity at any given time," and "there is *no support* for any definition of the term 'software scheduling agent' in which an entity represents, for instance, a whole subsystem *comprising large numbers* of manufacturing domain entities." *Id.* at 10. This single manufacturing domain entity representation is the patentees' explanation for why representing that "*any* software entity that schedules" is "a software scheduling agent is clearly wrong." *Id.* The patentees distinguished "software scheduling agent" from "any software entity that schedules," based on the representation of a single manufacturing domain entity.

Accordingly, as the patentees clearly and unmistakably argued, a "software scheduling agent" schedules activities on behalf of a single manufacturing domain entity. Thus, even if the term "software scheduling agent" could have a broader meaning in some other context, "it is well-established that '[t]he prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.'" *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed. Cir. 1995); *see also CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366-67 (Fed. Cir. 2002) ("[A] claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention."). The patentees' arguments during prosecution evinced a clear narrowing of scope by surrendering any potentially broader interpretation.

Moreover, the singular relationship emphasized during prosecution to distinguish prior art is consistent with the scope of the "present invention" of the '305 Patent. The specification supports Defendants' construction by repeatedly identifying software agents as associated with a single manufacturing domain entity. *See, e.g.*, '305 Patent at 6:61–64, 7:15–17, 10:62–11:3,

12:36–39, 13:16–19; '248 Patent at 6:63–67, 7:17–19, 10:64–11:5, 12:38–41, 13:18–21. Defendants' construction for the term is identical to the definition given in the specification, which is to restrict the "software scheduling agent" to a single manufacturing domain entity. "Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question." *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1341 (Fed. Cir. 2001) (citing *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000))

Plaintiff urges that no construction is necessary for "software scheduling agent." Contrary to Plaintiff's contention, the patentees clearly expressed a specific meaning for the term throughout the intrinsic record, including the specification and the arguments made before the PTO. As the patentees argued during prosecution, "any software entity that schedules" is not the same as a "software scheduling agent." Construing the term "software scheduling agent" to mean "a software agent that at least schedules activities on behalf of a single manufacturing domain entity at any given time" captures the scope of the claim in a manner that is consistent with the intrinsic evidence.

2. Court's Construction

For the reasons set forth above, the Court construes the term **"software scheduling agent"** to mean **"a software agent that at least schedules activities on behalf of a single manufacturing domain entity at any given time"**

G. "appointment state"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"appointment state"	No construction is necessary.	"Appointment" – "a time period certain in which the process tool has obligated itself to perform the process operation, and is defined by an appointment start time and an appointment end time." "Appointment state" – "status of an appointment at a given time"

1. Analysis

The term "appointment state" appears in Claim 3 of the '305 Patent, and Claims 3, 4, 7, and 9 of the '248 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the term requires construction.[9]

Contrary to Plaintiff's contention, the specification expressly defines the term "appointment." Specifically, the specification states an "appointment" is "a time period certain in which the process tool 115 has obligated itself to perform the process operation, and is defined by an Appointment Start Time ('TS') and an Appointment End Time ('TE')." '305 Patent at 11:34–38. The Court finds that this portion of the specification clearly demonstrates lexicography. *Vitronics Corp. v. Conceptronic*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("[A] patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history"); *Baxter Healthcare Corp. v. Mylan Labs. Ltd.*, 346 F. Supp. 3d 643, 655 (D.N.J. 2016) ("Indeed, the syntax of the specification alone supports the view that the patentees intended to express a definition, because it breaks off the term 'sterile' with quotes, and does so only in this instance.").

[9] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 17-18); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 23-24); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 14).

Plaintiff argues that the specification indicates that the "appointment" should not be limited to "processing appointments." Plaintiff contends that the specification states that "that not all appointments are processing appointments." '305 Patent at 11:65-66. The Court agrees that this further qualifies the express definition included in the specification. Accordingly, the recited "appointment" is not limited to a "processing" operation.

Furthermore, an "appointment state" is described in the specification as being the status of the appointment at any given time. '305 Patent at 12:40–43 ("An appointment, e.g., the processing appointment 375 in Fig. 3, exists in one of several 'states', or having a certain 'status,' at any given time."). The specification further sets forth several examples of "states" or "status" that an appointment may be in, including tentative, unready, ready, active, processing, near complete, complete, canceled, or aborted, among others. *Id.* at 12:40–67.

Plaintiff's contention that this term requires no construction, and that there is no basis for Defendants' construction ignores the intrinsic evidence. Here, the patentees expressly defined the term "appointment," and the specification provides a clear understanding of how "appointment state" should be understood by a person of ordinary skill in the context of the intrinsic evidence. *Phillips*, 415 F.3d at 1313 ("[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in the which the disputed term appears, but in the context of the entire patent, including the specification.").

2. Court's Construction

For the reasons set forth above, the Court construes the term **"appointment"** means **"a time period certain in which the process tool has obligated itself to perform an operation, and is defined by an appointment start time and an appointment end time."** The Court construes the term **"appointment state"** means **"status of an appointment at a given time."**

H. "factory state"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"factory state"	No construction is necessary.	"status of the factory at a given time"

1. Analysis

The term "factory state" appears in Claim 3 and 5 of the '305 Patent, and Claims 10 and 11 of the '248 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the term "factory state" should be construed to mean "status of the factory at a given time," as Defendants propose.[10]

As discussed with the previous term, the specification indicates how "state" would be interpreted by a person of ordinary skill in the art. Specifically, the specification indicates that "state" is the "status" at any given time. '305 Patent at 12:40–43. Regarding the term "factory state," the specification states the following:

> Factory state changes usually occur when the state of the factory, e.g., the process flow 100, changes. Factory state change events may originate from the MES 270 (shown in FIG. 2), the AMHS 280 (also shown in FIG. 2), or from the Equipment Interface ("EI", not shown) for the process tools 115. Factory state changes may include lot due date changes, a lot being put on hold, changing the process or process operation of a lot, a lot's location changing, a carrier arriving at a machine port, etc. For every factory state change that is a "predetermined event," the software agents 265 react accordingly. Exemplary factory state changes might include a downtime occurrence; a machine becoming available; a PM/Qual being detected; a chamber going down; a lot departing a machine; a move completed; and a wafer completed.

[10] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 18); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 24); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 14-15).

Id. at 13:61–14:8. As indicated, the specification states that the factory state changes based on different events. Accordingly, a person of ordinary skill in the art would understand that the term "factory state" means "status of the factory at a given time." Plaintiff ignores the teaching of the specification and fails to read the term in the proper context. Accordingly, the Court adopts Defendants' construction.

2. Court's Construction

For the reasons set forth above, the Court construes the term **"factory state"** to mean **"status of the factory at a given time."**

I. "advanced process control framework"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"advanced process control framework"	No construction is necessary.	"collection of computer programs allowing for controlling semiconductor process equipment"

1. Analysis

The term "advanced process control framework" appears in Claims 1-7 of the '402 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the term "advanced process control framework" should be construed to mean a "collection of computer programs allowing for controlling semiconductor process equipment," as Defendants propose.[11]

The Asserted Claims of the '402 Patent are directed to a method for fault detection of a processing tool and control thereof using an advanced process control (APC) framework. The specification explains that a particular problem in the industry is delay in reporting faults such that

[11] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 20); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 26-27); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 16).

corrective measures can be implemented in a more expedient manner. '402 Patent at 1:31–34. These delays result in the production of faulty devices, thereby increasing costs. *Id.* at 1:34–36. The specification addresses this problem by disclosing a method wherein a first interface receives operational state data of a processing tool related to the manufacture of a processing piece. *Id.* at 1:43–51. The state data is sent from the first interface to a fault detection unit and it is determined whether a fault condition exists with the processing tool based upon the state data. *Id.* If a fault exists, a predetermined action is performed on the processing tool. *Id.*

Regarding the term "advanced process control framework," the specification states the following:

> The fault detection system 120, upon evaluating the model reference file (MRF) 210 for the wafer currently being processed by the tool 105, sends the results of potential faults and/or proper operation of the tool 105 in the form of tool "health" data to the Advanced Process Control (APC) framework 135 (see FIGS. 1 and 2). The APC framework 135, in turn, may send control signals to the equipment interface 110 to control the processing tool 105 based upon the tool health data results forwarded from the fault detection system 120.

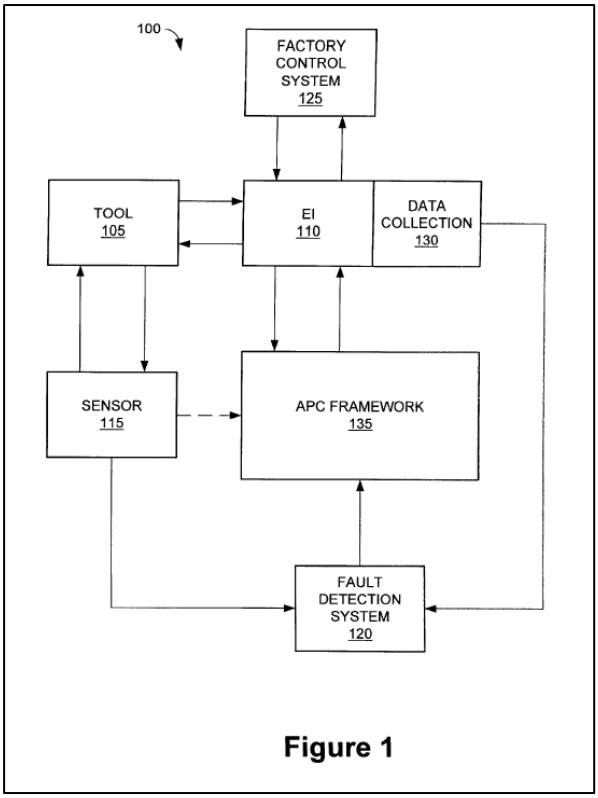

Figure 1

Id. at 4:19–24, Figure 1. To accomplish this task, the specification provides a detailed representation of the APC framework 135. Specifically, the specification states that the advanced process control framework, or APC framework, is "a component-based architecture comprised of interchangeable, standardized software components enabling run-to-run control of the processing tool 105." *Id.* at 4:41–44. Accordingly, the Court adopts the patentees' description of the APC framework,

Despite recognizing that the specification capitalizes the phrase "Advanced Process Control framework," and provides a description of the APC, Plaintiff argues that the disputed phrase "does not have any specialized meaning in the art or in the context of the '402 Patent." Dkt. #26 at 20. The Court disagrees. As set forth above, the specification provides a detailed description of the APC framework and indicates how a person of ordinary skill in the art would understand the term.

2. Court's Construction

For the reasons set forth above, the Court construes the term **"advanced process control framework"** to mean **"a component-based architecture comprised of interchangeable, standardized software components enabling run-to-run control of the processing tool."**

J. "concurrently measuring"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"concurrently measuring"	No construction is necessary.	"simultaneously measuring with a single measuring tool"

1. Analysis

The term "concurrently measuring" appears in Claims 19-21 of the '330 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the term "concurrently measuring" should be construed to mean "simultaneously measuring with a single measuring tool," as Defendants propose.[12]

The specification describes a method for "monitoring and/or controlling a semiconductor fabrication process," including by "concurrently measuring critical dimensions and overlay in a wafer undergoing the fabrication process." '330 Patent at 1:7–12; 21:13–15. "Critical dimensions" or "CD" are the "dimensions of and between features" on the semiconductor wafer. *Id.* at 1:29–30. Overlay is the alignment—or misalignment—of layers on the wafer. *Id.* at 1:41–51. The specification explains that CD and overlay are important to chip reliability and performance. *Id.* at 1:48–51. By concurrently measuring CD and overlay, the '330 Patent "mitigate[s] fabrication

[12] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 20-23); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 28-31); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 16-19).

inefficiencies" because "two operations are combined into one" thereby reducing "the time and real estate required for the fabrication process." *Id.* at 1:63–2:5.

Defendants argue that the specification states multiple times that the two concurrent measurements are taken "with a single measuring tool." Dkt. #33 at 28 (citing '330 Patent at 9:9–13; 11:46–50 (describing measuring CD and overlay "with a single measuring tool"), 7:48–50 (describing measuring CD and overlay "with a single tool")). Defendants further argue that if two machines are used to perform the two measurements, the "amount of test equipment" and "real estate" would both be increased, which would be contrary to the invention's purpose.

The Court disagrees that the intrinsic evidence requires reading into the claim the additional limitation that the measuring of CD and overlay occur "with a single measuring tool." The claim language does not limit concurrent measurements to a single tool. In fact, the claims require that "a measurement system . . . concurrently measures one or more critical dimensions and overlay . . . ." (*Id.* at Claim 1). The specification states that a "measurement system" collects measurements from one or more detecting components or detectors throughout the manufacturing process. *See, e.g.*,' 330 at Patent 9:28–31 ("One or more light detecting components 720 collect the reflected light 716 and transmit the collected light . . . to the measurement system 718"), 9:65–10:1 ("Reflected light 814 is collected by one or more light detecting components 816, and processed by a measurement system 818 for a concurrent determination of critical dimensions and overlay"), 13:7–11 ("When the electron beam 1014 strikes the structure 1004, electrons and X-rays . . . are detected by one or more detectors 1028 and are provided to the measurement system 1018 for a concurrent determination of critical dimensions and overlay"). Thus, the specification suggests that Defendants' construction requiring "concurrently measuring" to occur with a single tool is unwarranted and would limit the claims to a disclosed embodiment.

Indeed, Defendants' primary support for its construction are embodiments within the specification. Importantly, the description of these embodiments are immediately preceded by the term "[t]he structure *allows* these measurements [CD and overlay] to be taken concurrently with a single measuring tool . . . ." '330 Patent at 9:9–10, 11:46–48 (emphasis added). This permissive language does not limit the term. In other words, a single tool is contemplated, but is not a required claim limitation.

Defendants also cite the specification's statement that "[m]easuring critical dimensions and overlay in a single operation with a single tool (e.g., by scatterometry) mitigates fabrication duration and spacing requirements." Dkt. #33 at 28 (citing '330 Patent at 7:48–50). However, this section is just one embodiment and indicates that using a single measuring tool saves space. As discussed above, none of Defendants' citations provide an alternate definition for the term "a measurement system." None of the language cited by Defendants require detectors or detecting components to be with a single measuring tool. The claims do not discuss how many tools are to be used, or limit the number to one. Using a grating structure for concurrent measurements does not by itself limit how many tools are used to perform the measurements.

Defendants also argue that Plaintiff recently conceded to the Patent Office that "concurrently measuring" is simultaneously measuring with a single measuring tool. Defendants contend that Plaintiff sought to distinguish the Levy prior art reference by asserting that it allegedly failed to teach a person of ordinary skill in the art how to combine multiple embodiments for measuring CD or overlay into "one of the Levy tools:" The Court disagrees that Plaintiff argued for a single measuring tool in the IPR. Instead, Plaintiff distinguished Levy because it failed "to teach a POSITA how to use any of the described tools in the specific manner called for by the challenged claims of the '330 Patent." Dkt. #33-17 at 51. Specifically, Plaintiff argued that

"[w]hile Levy may teach that a POSITA can use a tool to take both types of measurements, Levy fails to describe how such measurements using any specific tool are supposed to be taken." *Id.* Contrary to Defendants' contention, this is not a clear concession that "concurrently measuring" is simultaneously measuring with a single measuring tool.

2. Court's Construction

For the reasons set forth above, the terms **"concurrently measuring"** is given its **plain and ordinary meaning.**

K. "collection purpose data"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"collection purpose data"	No construction is necessary.	"data indicating the initial purpose for collecting the metrology data"

1. Analysis

The term "collection purpose data" appears in Claims 1-9 of the '691 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The parties dispute whether the "collection purpose data" is data relating to the "initial" purpose.[13]

The Court finds that the patentee unambiguously defined "collection purpose data" as "the initial purpose for collection of the metrology data," and disclaimed any broader claim scope when distinguishing the prior art. The specification states that "[t]he collection purpose data indicates the initial purpose for the collection of the metrology data." '691 Patent at 6:17–19. More importantly, the patentee repeatedly confirmed this definition during prosecution. For example, in

[13] The parties' arguments for this disputed term can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 23-24); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 32-33); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 20).

its Response to Final Office Action Dated April 13, 2004, the patentee argued, "[a]s defined at lines 19-21 on page 11 of the Patent Application, the collection purpose data indicates the initial purpose for the collection of the metrology data." Dkt. #33-18 at 12 (emphasis in original). And later in that same response, the patentee reiterated that the "Examiner's interpretation is completely contrary to Applicant's definition of 'collection purpose.' In particular, as stated above, Applicant has defined the term 'collection purpose' to mean the initial purpose for the collection of the metrology data." *Id.* at 14.

When the examiner was not persuaded by these arguments, the patentee once again confirmed its express definition in its Appeal Brief to the Board of Patent Appeals and Interferences by arguing that "[a]s defined at lines 19-21 on page 11 of the Patent Application, the collection purpose data indicates the initial purpose for the collection of the metrology data, i.e. the reason the data is being collected." *Id.* at 5 (emphasis in original). Later in its Appeal Brief, the patentee again argued that "the Examiner's interpretation is completely contrary to the definition of the term 'collection purpose' set forth in the specification. In particular, as stated above, the term 'collection purpose' is defined in the specification to mean the initial purpose for the collection of the metrology data." *Id.* at 8 (emphasis in original). Accordingly, the specification and file history indicate that the patentee defined "collection purpose data" as "data indicating the initial purpose for collecting the metrology data."

Plaintiff concedes that the prosecution history applies to at least to the three independent claims. Dkt. #34 at 20. Plaintiff, however, argues that the specification contains instances discussing how the collection purpose data can be used for multiple purposes, not just the "initial" purpose. Dkt. #26 at 24 (citing '691 Patent at 6:44–49, 6:60–63, Claims 4-5, 13-14). To the extent that the claim language recites changing the "collection purpose data" in a dependent claim, the

claim language controls. Indeed, this claim language confirms that the collection purpose data in the independent claim is the "initial" purpose, and may be changed from the initial purpose as recited in the dependent claim.

2. Court's Construction

For the reasons set forth above, the Court construes the term **"collection purpose data"** to mean **"data indicating the initial purpose for collecting the metrology data."**

L. "significant fault" and "determining in said computer whether said parameter is a significant factor"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"significant fault"	No construction is necessary, or in the alternative, "abnormality or fault that relates to an actual fault"	Indefinite
"determining in said computer whether said parameter is a significant factor"	No construction is necessary. No construction is necessary, or in the alternative, "significant factor" means "a parameter that provides a significant contribution to the fault"	Indefinite (see "significant factor")

1. Analysis

The term "significant fault" appears in Claim 5 of the '538 Patent. The phrase "determining in said computer whether said parameter is a significant factor" appears in Claim 7 of the '538 Patent. The parties dispute whether the term "significant fault" and the phrase "determining in said computer whether said parameter is a significant factor" are indefinite for failing to provide objective boundaries.[14] The Court finds that the term "significant fault" and the phrase "determining in said computer whether said parameter is a significant factor" are not indefinite.

[14] The parties' arguments for these disputed terms can be found in Plaintiff's Opening Claim Construction Brief (Dkt. #26 at 26-27); Defendants' Responsive Claim Construction Brief (Dkt. #33 at 34-37); and Plaintiff's Reply Claim Construction Brief (Dkt. #34 at 20-23).

The specification provides context for the term "significant faults" when discussing the prior art. For example, the specification states that one problem with the prior art was that fault detection sensors in an IC manufacturing process could not adequately distinguish a false positive from an actual fault that actually impacted the process. '538 Patent at 2:65–3:4. According to the specification, in cases where the fault was "small enough that no significant impact to the process was present," the fault report would effectively be a "false positive." *Id.* at 3:1–3. The false positive nonetheless triggered an alteration to the manufacturing process. In other words, the false positive was triggered by a fault that had no impact on the material being processed "introduce[d] inefficiencies and idle times in a manufacturing setting." *Id.* at 3:3–4.

The specification further explains how this inefficient prior art process works. For example, suppose an IC manufacturer maintains small constraints in a pressure sensor at one step of the IC manufacturing process. *Id.* at 2:60–62. While manufacturers tried to make the manufacturing process as efficient as possible, a certain amount of "guess work" was required for manufacturers to determine which variances were "significant" and which variances were "harmless." *Id.* at 3:5–20. Any variation from the small constraints established by the manufacturer triggered a fault. *Id.* at 2:62–64. This was true even if the product of the manufacturing process was not negatively impacted by the pressure variation fault during that manufacturing step (*i.e.*, the pressure sensor fault was "harmless"). *Id.* at 2:64–67, 3:14–16. The specification contends that the prior art could not account for the fact that the end product (*i.e.*, an integrated circuit) was not impacted by the larger pressure variation, and therefore "introduces inefficiencies and idle times in a manufacturing setting." *Id.* at 3:3–4.

The specification uses "significant" in the context of describing that the product being manufactured is not impacted by an insignificant (*i.e.*, not important) fault. *Id.* at 5:51–59. By

identifying that the product being manufactured is not negatively impacted by the insignificant fault, the disclosed method purports to decrease the weight accorded to that type of fault. *Id.* By decreasing the weight of the insignificant fault in the fault detection analysis, the process promotes efficiency and eliminates an unnecessary alteration to the manufacturing process. The specification indicates that this is an advantage over the prior art, which required a certain amount of "guess work" to determine the faults that have a negative impact (*i.e.*, an actual fault) versus the faults that are harmless. *Id.* at 2:64–67, 3:14–16; Dkt. #26-2 at ¶ 69.

Regarding the term "significant fault," the specification indicates that it should be construed to mean "an actual fault." For example the specification states the following:

> The system 300 analyzes the fault data resulting from the fault data analysis and/or the PCA, in order to determine whether any particular parameters associated with any faults or abnormalities detected that are associated with the processing of semiconductor wafers 105 is actually a significant fault . . . In other words, *the system 300 determines whether the abnormality or fault indication relates to an actual fault*.

'538 Patent at 11:12–19 (emphasis added). Similarly, the specification states that "[i]f the system 300 or a user *determines that the fault is an actual fault*, the various contributions relating to each parameter may be examined." *Id.* at 11:37–40 (emphasis added). Likewise, the specification discusses when a fault is not an actual fault. *Id.* at 11:49–51 ("A user or the system 300 may then determine that the fault is not an actual fault."). Indeed, when asked whether a person of ordinary skill of art would readily ascertain what an actual fault is, Dr. Spanos agreed. Dkt. #26-3 at 84:13–19 ("Q: . . . My question is, for a skilled engineer, will there be any issue in terms of identifying whether there's an actual fault or a false positive? A: In a very narrow context with enough information known, I think skilled engineers could do that."). Accordingly, the Court finds that the term "significant fault" is not indefinite, and should be construed to mean an "actual fault."

Regarding the phrase "determining in said computer whether said parameter is a significant factor," the Court finds that the dispute relates to the term "significant factor" recited in this phrase. The Court further finds that the specification indicates that the term "significant factor" should be construed to mean "a parameter that contributed significantly to an actual fault." For example the specification states the following:

> Therefore, the dynamic PCA weighting module 370 may determine data and/or receive data that may be used to adjust the weight attached to a particular parameter. This information may be used by the fault detection unit 380 and/or the PCA controller 360 to perform analysis relating to any abnormality (and/or faults) during the processing of semiconductor wafers 105. In other words, after the fault condition is identified, the PCA weight calculation module 630 receives information from the fault data analysis module 610 and/or the fault data input interface 620 as to *whether the fault was an actual fault and/or whether any parameters associated with the abnormality or the fault contributed significantly to that fault or abnormality.* Based upon this data, the PCA weight calculation module 630 may decrease or increase the weighting of the parameter or, alternatively, leave the weighting of the parameter unchanged.

'538 Patent at 10:31–46 (emphasis added). Similarly, the specification states that "the system 300 may receive an indication from an external source, which could be an external computer, a controller, or a manual input from an operator, indicating whether *the detected fault is an actual fault and/or whether any parameters associated with the fault or abnormality provides significant contribution to the fault or abnormality*." *Id.* at 12:3–9 (emphasis added). Accordingly, the Court finds that the term "significant factor" should be construed to mean "a parameter that contributed significantly to an actual fault."

2. Court's Construction

For the reasons set forth above, the Court construes the term **"significant fault"** to mean **"an actual fault."** The Court also construes the term **"significant factor"** to mean **"a parameter that contributed significantly to an actual fault."**

III. CONCLUSION

The Court adopts the constructions above for the disputed terms of the Asserted Patents. Furthermore, the Parties should ensure that all testimony that relates to the terms addressed in this Order is constrained by the Court's reasoning. However, in the presence of the jury the Parties should not expressly or implicitly refer to each other's claim construction positions and should not expressly refer to any portion of this Order that is not an actual construction adopted by the Court. The references to the claim construction process should be limited to informing the jury of the constructions adopted by the Court.

IT IS SO ORDERED.

SIGNED this 8th day of February, 2022.

AMOS L. MAZZANT
UNITED STATES DISTRICT JUDGE